

*Stamps*

*Aug. 1949*

ANALYSIS OF RETURNS FROM Banded  
EASTERN MOURNING DOVES

Harold S. Peters, Flyway Biologist,  
Fish and Wildlife Service,  
Glenn Bldg., Atlanta, Ga.

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A total of 33,247 Eastern Mourning Doves (Zenaidura macroura carolinensis) have been banded in 33 states and provinces from 1920 (when the banding program was taken over by the Federal Government) to June 30, 1948. A total of 15,143, or 45.6%, of these were banded in the 11 states comprising Region 4 of the Fish and Wildlife Service. These southeastern states are: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. These states have recently embarked upon a cooperative study of the Eastern Mourning Dove, each state setting up a Federal Aid Project. In order to provide foundation information for the study the present paper has been undertaken. The banding records of the Fish and Wildlife Service, at the Patuxent Research Refuge, Laurel, Maryland, were carefully studied to secure the following information.

Only 1242 banded doves have been recovered to the close of the 1948-49 dove hunting season. This is 3.74% of the total number banded, far less than the percentage of returns commonly obtained from banded ducks. Of this total of 1242, 561 were recovered outside of the state in which they were originally banded. Thus, only 1.69% of the 33,247 banded doves have been taken in "foreign" states.

While the 11 states of Region 4 banded only 45.6% of the doves, they have had 64.2% of all the returns (797 of 1242). However, these 11 states have reported 438, or 78% (of 561) of the recoveries outside of the state of banding. This high percentage of returns may naturally be expected in the important dove hunting states.

Of the 561 doves recovered outside the state in which they were banded, only 88 (15.7%) were banded in the states of Region 4. Sixty-eight (77%) of these were taken in other Region 4 states, and only 20 were taken in the states outside of this southeastern region. Perhaps it is surprising that 473 (or 84.3%) of the 561 returns, were banded in the states outside of Region 4, and 438 (or 92.6%) of these were taken in Region 4. These figures show the importance of all states in a banding program of the Eastern Mourning Dove; for, although most of the recovered doves were originally banded north of Region 4, a very high percentage was recovered in this region.

Perhaps when doves are banded in a large number of states throughout the calendar year, we shall secure sufficient recoveries to enable us to better understand the movements of doves. So far, most of the banding in the northern states has been done in the summer and early fall months and the recoveries have been mainly during the fall and winter months when doves are being hunted. We shall undoubtedly have many doves caught in banding traps throughout the southeastern states during the present intensive dove study. Until returns have accumulated from these anticipated activities, it is rather difficult to secure definite information on movements of doves from the small number of dove returns now at hand. However, I shall present the information secured from these returns on the following pages.

Table 1 shows the numbers of Eastern Mourning Doves which were banded in 33 states and provinces from 1920 until June 30, 1948. These are divided into "adult" and "juvenile". However, this is not a reliable division for many banders are confused as to the meaning of various terms, as nestling, fledgling, immature, juvenile, young, and the like. Many of the doves in the "juvenile" column were banded as nestlings, while others were of larger size and flying. Consequently, these two columns cannot be accepted for more than in indication of nestling and very young birds (in the "juvenile" column) and of large juveniles and adults (in the "adult" column).





Table 2 shows that the 1242 recoveries were originally banded in 29 states and provinces and that they were recovered in 37 states and provinces. Repeats are not included, but only returns. (A "return" is a bird retrapped at station of banding more than 3 months after banding or recovered over 10 miles from the point of banding).

Tables 3 ("Recoveries of doves banded in hunting states") and 4 ("Recoveries of doves banded in non-hunting states") are restricted divisions of Table 2, in which the returns to the state of original banding have been excluded and in which the states have been divided into hunting and non-hunting classifications. It will be noted that Table 3 (hunting states) lists 183 recoveries banded in the 11 states of Region 4, and that 180 of these were recovered from hunting states. Less than 1% of the doves banded in these states (18,723) were recovered. By comparison, Table 4 (non-hunting states) lists 378 recoveries from 13 states and provinces, 371 of these being taken in 18 hunting states. About 2.75% of the doves banded in these non-hunting states (13,796) were recovered.

A summary of the records of individual states is given in the following sections, first for the 11 states of Region 4 and then for those northern states furnishing the most interesting records. For each state the total number of doves banded is given, with a list of the doves recovered in other states, and another list showing where the doves were originally banded which have been taken in the state. These lists have been divided into sections to show the two major migration routes.

One of these major routes is through the Mississippi River Valley, starting with Minnesota, Wisconsin, and Michigan, and moving southward through states on both sides of the river to the Gulf of Mexico. There the route branches, one going through Louisiana and Texas to Mexico, and the other eastward through Mississippi, Alabama, and Georgia to Florida. The other major migration route is along the Atlantic coast, starting in Massachusetts, New York, Pennsylvania, and New Jersey, and moving southward between the mountains and ocean to Georgia and Florida. Here some doves swing westward along the Gulf of Mexico, a few even continuing west and southward to Texas and Mexico. Some doves probably use a third route, to cross eastward from Ohio to Pennsylvania and Maryland. Small numbers of doves undoubtedly move northward and southward between the two main migration routes, and others may cross eastward and westward through valleys and mountain passes. Until further information is secured by banding, the two major routes can be used to portray the movements of most of the recoveries of banded doves. Slight deviations or off-shoots of these may be evident from some of the following sections.

#### SUMMARY OF STATES IN REGION 4:

##### 1. ALABAMA.

2555 doves have been banded in Alabama. Only 21 of these, or .82%, have been recovered outside of the state. These were from:

Ga.	6	Tenn.	2
Fla.	8	Mo.	1
S. C.	2	Mich.	1
Md.	1		<u>4</u>
	<u>17</u>		



There have been 132 banded doves recovered in Alabama. Fifty-one of these were banded outside of the state, in:

Wisc.	2	Mass.	7
Ill.	3	N. Y.	1
Mich.	12	Pa.	2
Ind.	5	W. Va.	1
Ohio	<u>11</u>	N. C.	1
	33	Fla.	<u>6</u>
			18

The remaining 81 were originally banded in Alabama; recovered in the following years subsequent to banding:

Same year	42
1 yr. later	21
2 " "	13
3 " "	2
4 " "	1
6 " "	1
7 " "	<u>1</u>
	81

It appears that Alabama received birds, in the southward migration, from the Mississippi Valley route and also from the Atlantic coastal route. Evidently her doves are dispersed, in northward migration, by these same two routes. This is illustrated by the divisions above.

## 2. ARKANSAS.

Ninety-six doves have been banded in Arkansas. None of these have been taken outside of the state.

Only 7 banded doves have been taken in the state. Six of these were banded outside of Arkansas, as follows:

Fla.	2
Ill.	3
Ind.	<u>1</u>
	6

The other bird was banded in Arkansas and retaken there one year later.

Evidently Arkansas is on a southward route from the eastern side of the Mississippi River Valley. It also is on the northward route from the southeast - along the Gulf coast and northward in the Mississippi River Valley, but we have too few records for definite conclusions.

## 3. FLORIDA.

More doves have been banded in Florida than in any other state, a total of 7,096. Most of these (6344) were banded by W. W. demeritt, at Key West, before the past war. It is strange that only 46 (less than two-thirds of 1%) have been recovered outside of Florida, as follows:





Ga.	14	Ala.	6	Ark.	2	Cuba	5
S.C.	3	Miss.	1	Ky.	1	Dominican Republic	1
N.C.	2	La.	1	Ill.	8		6
	19	Tex.	1		11		
		Mex.	1				
			10				

Twenty-two of these 46 were recovered within the year of banding; 15 in the first year after banding; 5 in the second year; 2 in the third year; 1 in the sixth year; and 1 in the eighth year after banding.

The doves recovered in Cuba and Dominican Republic raise a very important question. Does it mean that our eastern doves go to the West Indies, or does it mean that West Indies doves (Z. m. macroura) come to Florida occasionally, especially in the fall and winter? Unfortunately, we have no subspecific identifications of these six doves. Three were banded in the third week of October; 1 being taken in Pinar del Rio just 7 days later; 1 taken in Habana 22 days after banding; and the third taken the first week of April, 1½ years after banding. One was banded the second week of November and recovered the fourth week of the following January; and 1 banded the fourth week of July was taken at Habana the third week of the following February. A dove banded at Gulfport, Florida, on March 30, 1932, was taken at Santiago, Dominican Republic, about July 25, 1934. This is a most unusual record; indicating that a West Indian dove wintered in Florida and returned to nest in north-central Dominican Republic. These recoveries illustrate the necessity for intensive banding in southern Florida and in Cuba, in order to work out any migration from the United States to the West Indies, or vice versa.

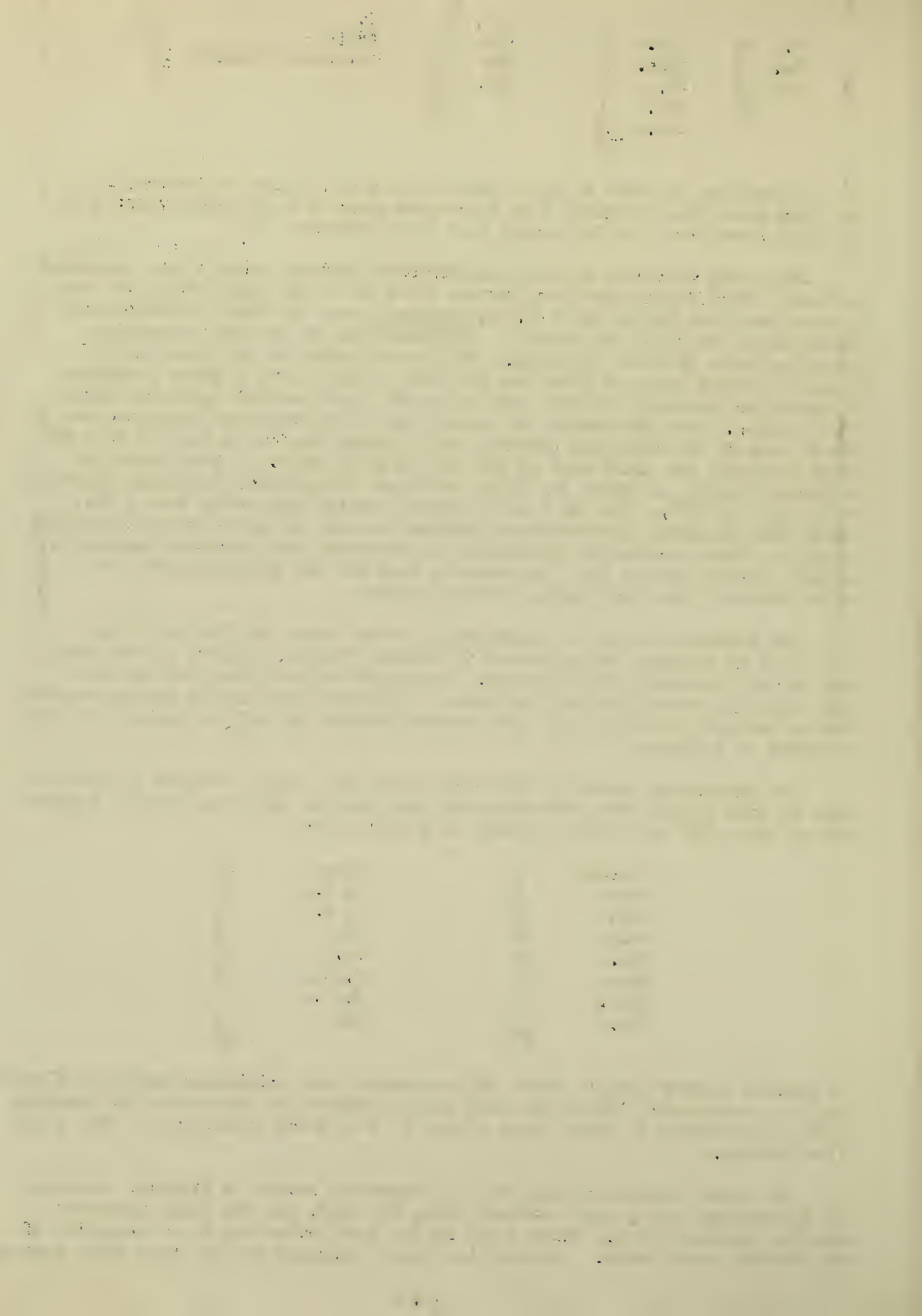
The Mexican recovery is interesting, being banded in Florida in the first week of December and recovered at Merida, Yucatan, Mexico, in the first week of the following month, January. We wonder whether this bird may have flown directly across the Gulf of Mexico; southward from Florida through western Cuba to Yucatan; or whether it went westward around the Gulf of Mexico and then southward to Yucatan.

The surprising number of 268 banded doves have been recovered in Florida, which is 21½% of all dove recoveries and more than in any other state. Eighty-nine of these 268 were banded outside of Florida, in:

Manitoba	1	Mass.	11
Wisc.	1	N. Y.	5
Ill.	10	N. J.	1
Mich.	20	Pa.	3
Ind.	10	Va.	2
Ohio	11	N. C.	2
Tenn.	2	S. C.	1
Ala.	8	Ga.	1
	63		26

One hundred seventy-nine of these 268 recoveries were originally banded in Florida. They were recovered: 142 in the same year as banded; 23 one year after banding; 7, two years after; 3, three years after; 3, four years after; and 1, five years after banding.

The above recoveries show two main migration routes to Florida; one down the Mississippi Valley then eastward along the Gulf; and the other southward down the Atlantic coast. Those found in the West Indies may be an extension of the Atlantic coast route. No doves have been recovered in Cuba from other states.



#### 4. GEORGIA.

Only 454 doves have been banded in Georgia, of which only one has been taken in another state (Florida).

However, 175 banded doves have been recovered in Georgia, the second largest number of recoveries from any state. There were 145 banded in other states, as follows:

Wisc.	3	Ontario	2
Ill.	15	Mass.	35
Mo.	1	N. Y.	9
Mich.	24	Pa.	7
Ind.	7	N. J.	3
Ohio	13	W. Va.	1
Tenn.	2	Va.	2
Ala.	6	S. C.	<u>1</u>
Fla.	<u>14</u>		60
	85		

This represents 25% of the 561 returns taken in states other than where they were originally banded. Thirty of the 175 recoveries were originally banded in Georgia. They were recovered: 22 in the same year after banding; 6 the first year following; and 2 the second year following banding.

These recoveries again show the two major migration routes, one down the Mississippi Valley, and the other down the Atlantic Coast. Georgia and Florida together account for 35.7% of the 1242 recoveries of banded doves, while Georgia, Florida, Alabama, and South Carolina account for 46% of all band recoveries. This illustrates the importance of these states as winter concentration areas of doves from many parts of eastern North America.

#### 5. KENTUCKY.

One hundred seventy-seven doves were banded in Kentucky, of which none have been retaken outside the state. Five banded birds have been recovered in Kentucky; 1 from Florida, 1 from Michigan, and 3 from Kentucky - 2 being taken the same year of banding and 1 the second year after banding.

#### 6. LOUISIANA.

Two hundred thirty-five doves have been banded in Louisiana, and none have been found outside that state.

Forty-eight banded doves have been taken in Louisiana. Forty of these were banded outside the state:

Wisc.	1	Mass.	2
Ill.	11	N. Y.	1
Mich.	9	Fla.	1
Ind.	4	Miss.	<u>1</u>
Ohio	8		5
Iowa	1		
Mo.	<u>1</u>		
	35		

Eight of the 48 were originally banded inside the state. These were recovered: 7 in the same year of banding, and 1, one year after banding.





The recoveries from outside of Louisiana show that the main migration route is down the Mississippi Valley, but that a few straggle there from the Atlantic coast - Gulf coast route.

## 7. MISSISSIPPI.

One thousand, three hundred thirty-one doves were reported banded in Mississippi, but only one has been recovered outside the state - in Louisiana. The small number of returns may be due to nestling mortality since most of these were banded as nestlings.

Fifteen banded birds have been taken in the state. Seven of these were banded in other states, as follows:

Mich.	4
Ind.	2
Fla.	1
	<u>7</u>

Eight of the 15 were originally banded in this state, and were recovered: 5 in the same year as banded and 3, one year after banding.

The few recoveries in Mississippi do not show much in the way of migration, but do serve to strengthen the theory of two major routes.

## 8. NORTH CAROLINA.

Two thousand, five hundred eight doves have been banded in North Carolina, of which 8 were taken in other states:

Va.	1	S. C.	3
Md.	1	Fla.	2
	<u>2</u>	Ala.	1
			<u>6</u>

Seventy banded birds have been recovered in this state. Thirty-eight of these 70 were banded in other states, as follows:

Mass.	12	Mich.	6
N. Y.	4	Ohio	3
Pa.	5	Ind.	2
N. J.	2		<u>11</u>
D. C.	1		
Va.	1	Fla.	2
	<u>25</u>		

Thirty-two of the 70 were originally banded in North Carolina, and were recovered: 25 in same year of banding; 3 one year after banding; 2 two years after; 1 three years after; and 1 five years after banding.

Again, these recoveries illustrate the two major migration routes. Probably the doves from Michigan, Ohio, and Indiana, cut eastward to the Atlantic coast, then southward, although they may have traveled southward to the Gulf, then northward to North Carolina.

## 9. SOUTH CAROLINA.

Only 146 doves have been banded in South Carolina. Two of these were taken outside the state; 1 in Georgia and 1 in Florida.





Fifty banded doves have been taken in South Carolina. Forty-seven of these were banded in other states:

Mass.	19	Wisc.	1
N. Y.	4	Mich.	3
Pa.	5	Ohio	4
Md.	2	Ind.	1
N. C.	3	Ala.	2
	<u>33</u>	Fla.	3
			<u>14</u>

Three of these 50 were originally banded in South Carolina, and were taken: 2 in same year of banding, and 1 one year after banding.

These returns come from the two major migration routes, although some may have crossed from Ohio to the Atlantic Coast.

#### 10. TENNESSEE.

Four hundred twenty-three doves have been banded in Tennessee, and 4 of these have been recovered: 2 in Georgia and 2 in Florida.

Twenty-two banded doves have been recovered in this state. Eight were banded in other states:

Mich.	2	Mass.	1
Ohio	1	Ala.	<u>2</u>
Ill.	<u>2</u>		<u>3</u>
	<u>5</u>		

Fourteen of the 22 were originally banded in Tennessee, and were taken: 10 in the same year of banding, 3 one year later, and 1 two years after banding.

It is not clearly evident how the doves got to Tennessee, although I believe the Massachusetts birds may have come down the Atlantic coast and wandered northward to the state. Some may have crossed over from Pennsylvania or Maryland to Ohio and then southward, however.

#### 11. VIRGINIA.

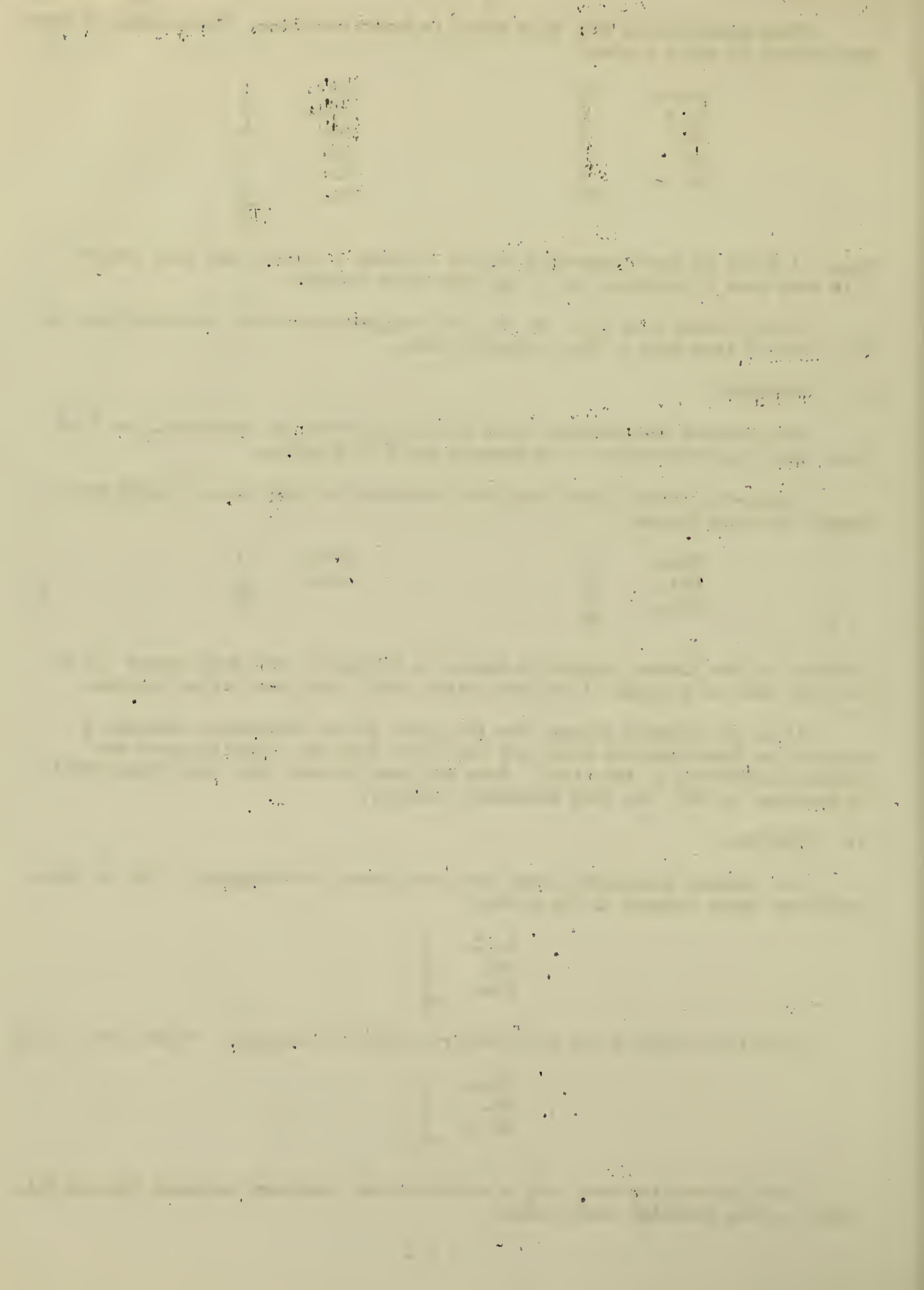
One hundred twenty-two doves have been banded in Virginia. Five of these have been taken outside of the state:

N. C.	1
Ga.	2
Fla.	<u>2</u>
	<u>5</u>

Only five banded doves have been recovered in Virginia. These were banded:

Mass.	2
Pa.	2
N. C.	<u>1</u>
	<u>5</u>

These recoveries show only a northward and southward movement through this state, on the Atlantic coast route.



SUMMARY OF STATES OUTSIDE OF REGION 4:

1. ILLINOIS.

Two thousand, one hundred ninety-nine doves have been banded in the state, of which 58 were recovered in other states:

Ark.	3	Tenn.	2
La.	11	Ala.	3
Tex.	14	Ga.	15
	28	Fla.	10
			30

Sixty-six banded birds were taken in this state. Ten of these were banded outside of Illinois:

Mich.	1
Ind.	1
Fla.	8
	10

Fifty-six of these 66 birds were originally banded in Illinois and were recovered there: 31 in the same year of banding; 16 one year after banding; 7 two years after; and 2 three years after banding.

2. INDIANA.

In this state 1412 doves were banded. Forty-one were taken outside of the state:

Mich.	1	Miss.	2
Ill.	1	Ala.	5
Ark.	1	Ga.	7
La.	4	Fla.	10
Tex.	6	S. C.	1
Mex.	1	N. C.	2
	14		27

Only 23 banded birds have been reported from Indiana. Three of these were banded in other states: 2 in Michigan and 1 in Ohio. Twenty were originally banded in Indiana and were recovered: 9 in same year as banded; 8 one year after banding; 2 two years after; and 1 three years after banding.

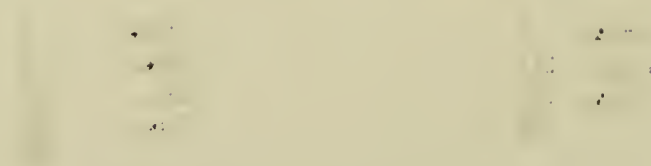
3. IOWA.

In this state 1697 doves were banded. Thirty were taken in other states:

Nebr.	1
Okla.	3
La.	1
Tex.	18
Mex.	7
	30

Only 6 banded birds have been taken in the state, all of which were originally banded there. They were recovered: 2 in same year as banded; 2 one year

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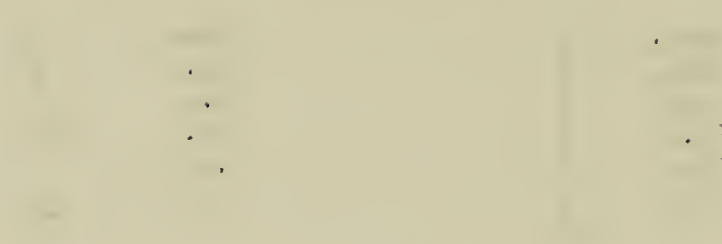


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after banding; 1 two years after; and 1, three years after banding. It is interesting to note that none of the doves banded in Iowa have crossed the Mississippi River.

#### 4. MARYLAND.

Four hundred twelve doves were banded, and only 3 were taken outside the state:

D. C.	1
S. C.	2
	<u>3</u>

Thirty-nine banded birds have been recovered in Maryland; 11 from other states:

Mass.	3
N. Y.	2
D. C.	3
N. C.	1
Ala.	1
Mich.	1
	<u>11</u>

Twenty-eight were originally banded in the state and were recovered: 17 in same year as banded; 7 one year after; and 4 two years after banding.

#### 5. MASSACHUSETTS.

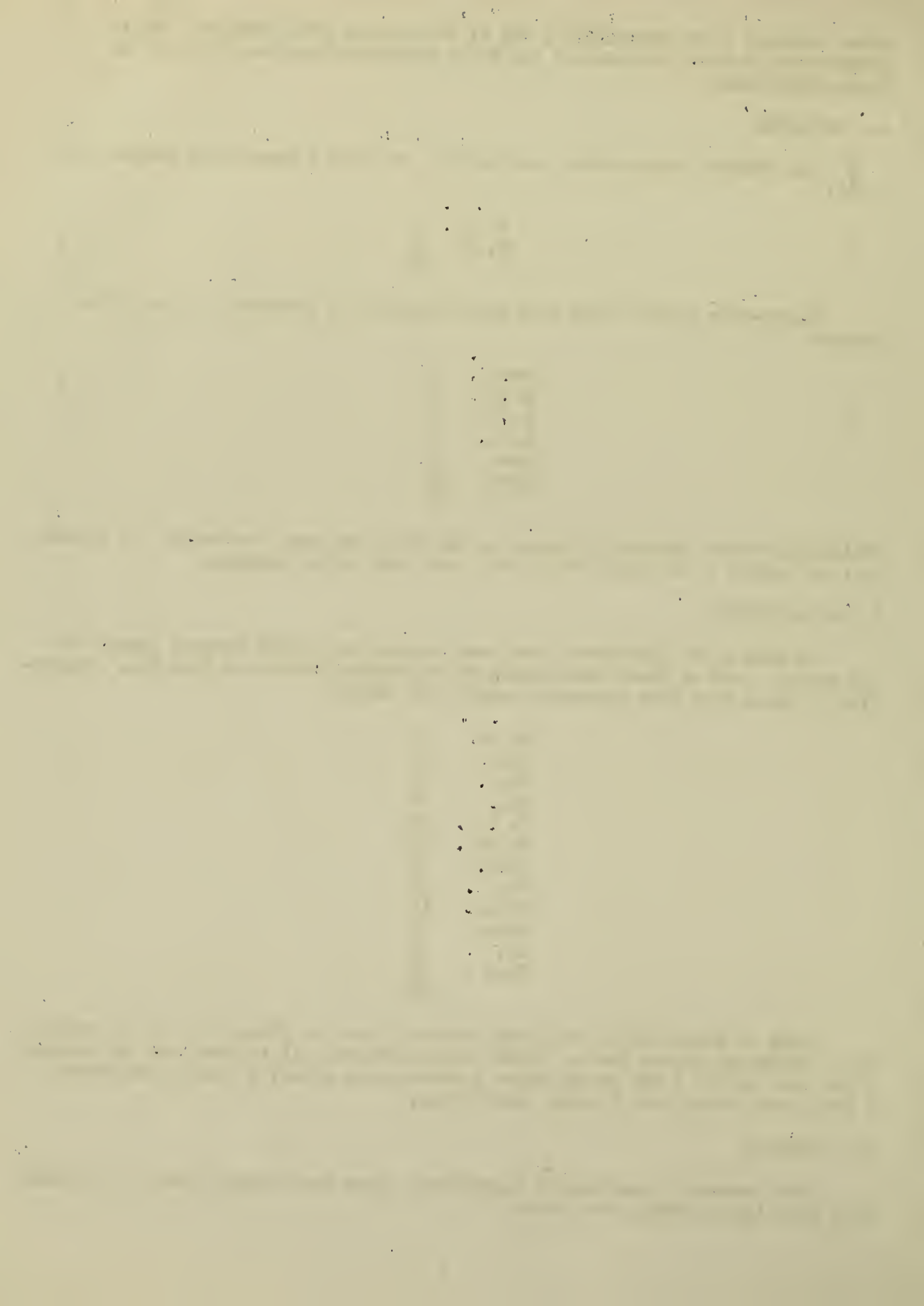
In this state 3160 doves have been banded, the second largest number of any state. Most of these were banded at the Austin Station on Cape Cod. Ninety-five of these have been recovered outside the state:

N. J.	1
Del.	1
Md.	3
Va.	2
N. C.	12
S. C.	19
Tenn.	1
Ga.	35
Fla.	11
Ala.	7
La.	2
Tex.	1
	<u>95</u>

Only 30 banded birds have been reported from the state, and all of these were originally banded there. These were recovered: 11 in same year of banding; 9 one year after; 4 two years after; 3 three years after; 1 four years after; 1 five years after; and 1 eight years after.

#### 6. MICHIGAN.

One thousand, nine hundred sixty-three doves were banded here, 92 of which have been taken outside the state:



Ind.	2	Ala.	12
Ill.	1	Ga.	24
Ky.	1	Fla.	20
Tenn.	2	S. C.	3
Miss.	4	N. C.	6
La.	9	Md.	<u>1</u>
Tex.	<u>7</u>		<u>66</u>
	26		

Seventeen banded doves have been taken in the state; 3 had been banded in other states (Ala. 1; Ohio 1; and Indiana 1); and 14 were originally banded in Michigan. These last were recovered: 5 in same year; 6 one year later; 2 two years later; and 1 four years after banding.

## 7. NEW YORK.

Nine hundred thirty-four doves were banded in the state; 26 being recovered in other states:

Md.	2
N. C.	4
S. C.	4
Ga.	9
Fla.	5
Ala.	1
La.	<u>1</u>
	<u>26</u>

Forty-seven banded birds were taken in New York, all of which were originally banded there. They were recovered: 13 the same year; 18 one year after; 13 two years after; and 3 three years after banding.

## 8. OHIO.

Three thousand, seventy-two doves have been banded, making Ohio the third state in numbers of doves banded. Sixty-one were recovered outside of Ohio:

Tenn.	1	Ala.	11	Mich.	1
La.	8	Ga.	13	Ind.	<u>1</u>
Tex.	3	Fla.	11		<u>2</u>
Mex.	3	S. C.	4		
Ariz.	<u>2</u>	N. C.	<u>3</u>		
	17		142		

The two recoveries from Arizona are quite surprising. They both were banded at Lakewood, Ohio, and both were recovered at Phoenix, Arizona. One banded June 10, 1937 was taken October 26, 1937, while the other was banded May 6, 1938 and recovered September 15, 1939. Some Ohio raised birds winter in Mexico, as indicated by the 3 recovered there: one banded the second week of June was taken in Mexico the first week of October one year afterwards; one banded the fourth week of June was taken the third week of the following February; while the third banded the third week of August was not recovered until December, 7 years later! These figures indicate that some Ohio birds are in Mexico from October to February.

Sixty banded birds were taken in the state, all of which were originally banded there. They were recovered: 33 in same year; 18 one year after; 6 two years after; 1 three years after; 1 four years after; and 1 five years after banding.



Ohio birds evidently migrate down the Mississippi Valley but some probably cross the mountains eastward to the Atlantic coast.

#### 9. PENNSYLVANIA.

In this state 1033 doves were banded, and 25 have been taken in the following states:

Va.	2
N. C.	5
S. C.	5
Ga.	7
Fla.	3
Ala.	2
	<u>24</u>

One strayed northward to Prince Edward Island, Canada, where doves are quite rare. It was banded at Paoli, Pennsylvania, June 15, 1933, and was found dead at Bayview, Prince Edward Island, December 1, 1933. It is a most unusual record.

Twenty-seven banded doves have been taken in the state, all of them being banded there originally. They were recovered: 11 in the same year; 12 one year after; 2 two years after; 1 three years after; 1 four years after banding.

#### 10. TEXAS.

One hundred twenty-one doves have been banded in Texas, none of which have been taken outside of the state.

Sixty-nine banded doves have been taken there; 63 of which were banded in:

Minn.	6	Mass.	1
Wisc.	4	Fla.	<u>1</u>
Mich.	7		2
Ohio	3		
Ind.	6		
Ill.	14		
Iowa	18		
Mo.	<u>3</u>		
	61		

Six birds were banded originally in Texas and were recovered: 4 in same year; 1 one year later; and 1 two years after banding.

#### 11. WISCONSIN.

Five hundred fifty-seven doves were banded in this state, of which 12 were taken in:

La.	1
Tex.	4
Ala.	2
Ga.	3
Fla.	1
S. C.	<u>1</u>
	12





Eight banded doves have been taken in the state, all originally banded there. They were recovered: 4 in same year of banding, and 4 one year after banding.

. . . . .

A summarized analysis of the southward migration is given in Table 5. The northward migration is the reverse of this southward migration, as shown in the accounts of the separate states.

#### INTERVAL BETWEEN BANDING AND RECOVERY

The recoveries in the same state of banding have been summarized in Table 6. This shows that nearly 60% of the 681 recoveries were within the first twelve months after banding, and that 95.6% were within the first 36 months after banding. One dove was taken 7 years and another 8 years after the year of banding.

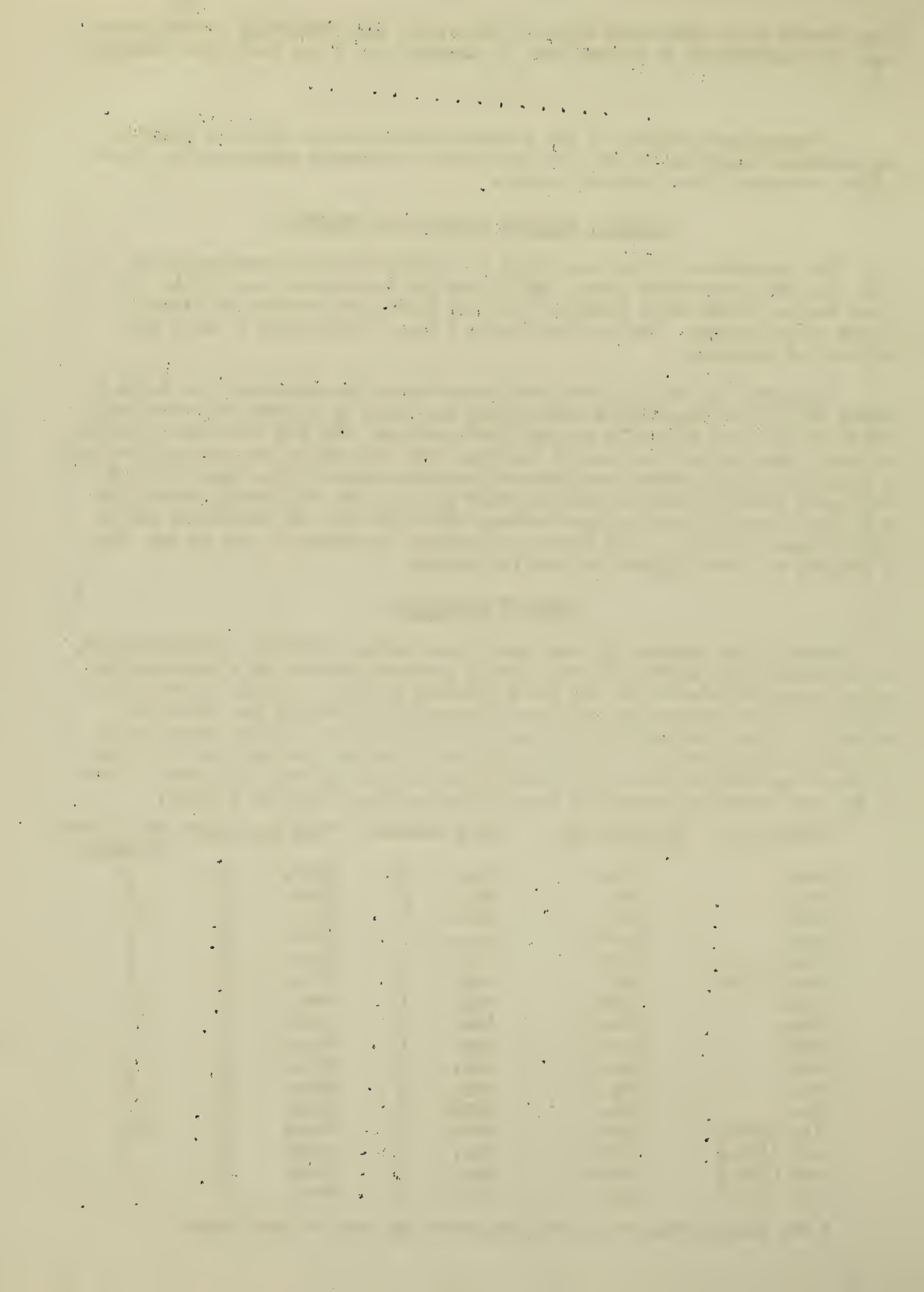
Recoveries in states other than where banded are summarized in Table 7. Almost 61% of the 561 returns were within the first 12 months after banding, and about 91% were within 36 months after banding. One was recovered 7 years and two 8 years after the year of banding. The two tables are very similar and no appreciable differences are evident between returns to the same state of banding as compared with returns to other states. The relatively short life of a dove is well shown by these tables, since the bulk of recoveries was of birds killed. However, they were not separated according to age at the time of banding so exact figures can not be secured.

#### SPEED OF MIGRATION

Most of the returns of doves have been secured from the southern states, in which doves are hunted, so the time of recovery depends to a considerable degree upon the dates of the legal shooting seasons. Hence, we should not use the date of recovery as the date of arrival of birds in the states of Region 4. Also, the banding date does not indicate the date on which doves left the northern states. Consequently the following list will not give the departure nor arrival dates, but merely the banding and recovery dates. Some of the more rapid movements, as shown by these dates, were as follows:

<u>Banded In:</u>	<u>Recovered In:</u>	<u>Week Banded:</u>	<u>Week Recovered:</u>	<u>No. of wks. Elapsed:</u>
Mass.	Ala.	Aug. 1*	Sept. 1*	4
Mass.	Ga.	Aug. 3	Sept. 4	5
Mass.	La.	Sept. 1	Dec. 1	12
Mass.	S. C.	Aug. 3	Sept. 4	5
Minn.	Texas	July 2	Sept. 2	8
Wisc. (juv.)	Ga.	Aug. 1	Sept. 3	6
Wisc.	Texas	Aug. 1	Oct. 3	10
Wisc.	Texas	Aug. 3	Oct. 2	7
Mich.	S. C.	Aug. 1	Sept. 4	7
Ohio	Texas	Aug. 1	Oct. 2	9
Ind.	La.	Aug. 4	Oct. 3	7
Ill.	Fla.	Sept. 3	Nov. 4	9
Ill. (juv.)	Texas	July 1	Sept. 4	11
Iowa (juv.)	Texas	Aug. 1	Sept. 4	7
Iowa (juv.)	Texas	Aug. 3	Oct. 2	7
Iowa (juv.)	Texas	Aug. 4	Oct. 2	6

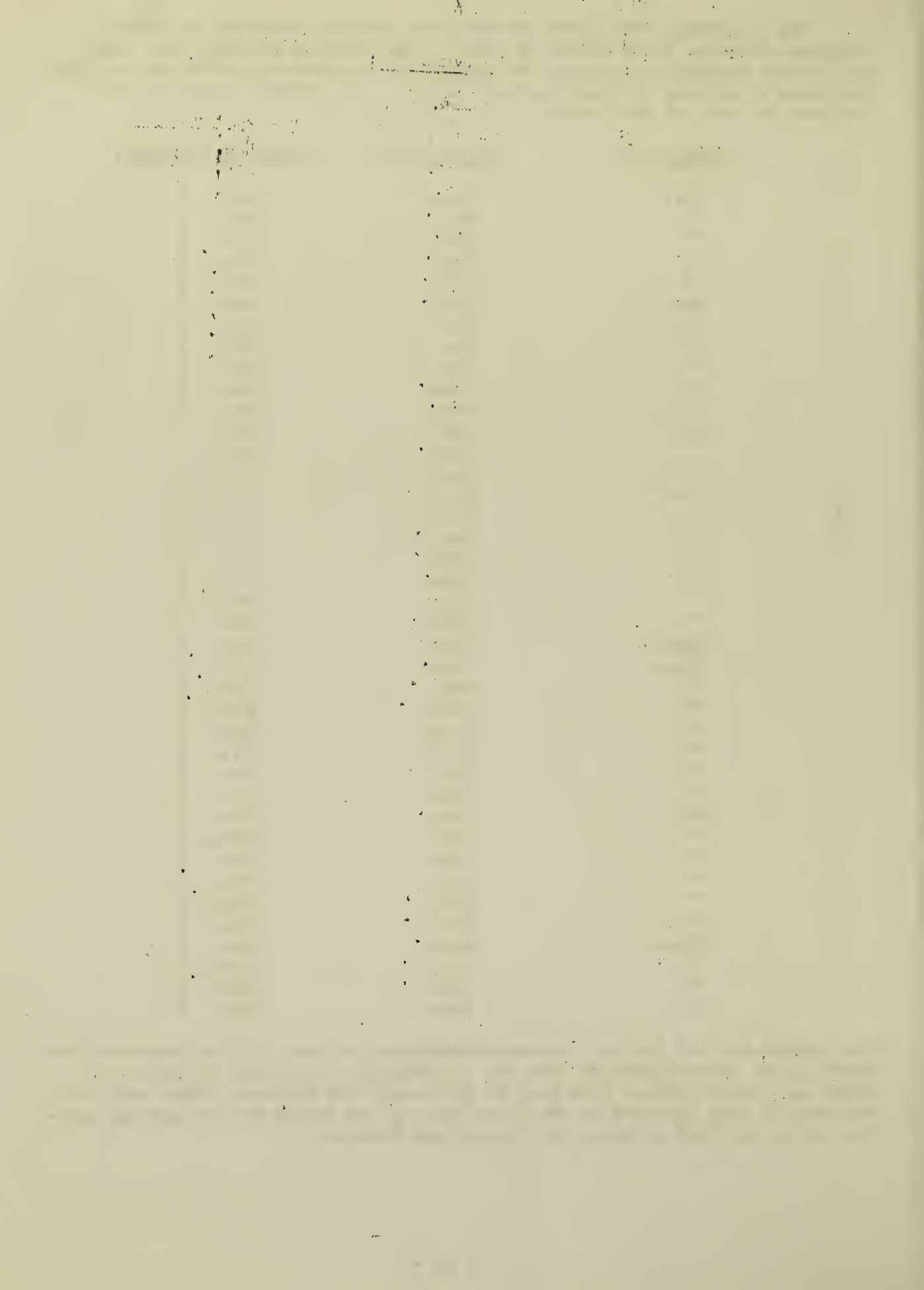
\* The figure after the month indicates the week of that month.



The following table gives the earliest dates of recovery in certain southern states of doves banded in some of the northern states. Here again the figures probably illustrate the opening of the hunting seasons rather than the times of arrival in these southern states. The figures after the month indicate the week of that month.

<u>Banded In:</u>	<u>Recovered In:</u>	<u>Earliest Recovery:</u>
Ill.	Ala.	Dec. 4
"	Ga.	Nov. 3
"	Fla.	Nov. 4
"	La.	Nov. 1
"	Tex.	Sept. 2
Ind.	Ala.	Nov. 4
"	Fla.	Nov. 3
"	Ga.	Dec. 4
"	La.	Oct. 3
"	Tex.	Oct. 2
"	Mex.	Dec. 2
Iowa	La.	Nov. 2
"	Tex.	Sept. 1
"	Mex.	Oct. 1
Mass.	N. C.	Oct. 4
"	S. C.	Sept. 4
"	Ga.	Sept. 4
"	Fla.	Nov. 4
"	Ala.	Sept. 1
"	La.	Dec. 1
"	Tex.	Jan. 3
Minn.	Tex.	Sept. 2
Mich.	Ala.	Nov. 3
"	Ga.	Sept. 3
"	Fla.	Nov. 3
"	S. C.	Sept. 2
"	N. C.	Nov. 3
"	La.	Nov. 3
"	Tex.	Oct. 1
Ohio	Ala.	Nov. 4
"	Ga.	Sept. 3
"	Fla.	Nov. 1
"	La.	Oct. 2
"	Tex.	Sept. 4
"	Mex.	Oct. 1
Wisc.	Ala.	Dec. 4
"	Ga.	Sept. 3
"	Fla.	Nov. 4
"	Tex.	Oct. 2

The figures are too few to show much concerning the speed of the southward migration, but birds migrating down the Mississippi Valley seem to arrive in Texas and Mexico earlier than they do in Georgia and Florida. This would be expected if they fly down to the lower part of the valley before turning eastward along the Gulf of Mexico to Georgia and Florida.





## CONCLUSIONS

The dove returns analyzed in this paper show that doves banded during the summer in many northern states are taken in considerable numbers in the southern states during the hunting season. This indicates the necessity of continued banding in all states in the range of the Eastern Mourning Dove during the period of the dove study in Region 4. Nestlings should be banded throughout the nesting season. The age of the doves should be given on banding schedules as "nestling", "juvenile", or "adult". A large number of banding stations operated in each state should result in trapping banded birds, giving valuable information on the movements of doves without having to depend solely on hunters' kills.

A very low percentage of returns is obtained from doves, which indicates the need for a campaign of publicity to induce hunters and others to report banded doves, and other birds.

We need to know when the doves raised in the first and second broods leave their home area and begin to migrate. We need information on the speed of migration. We have very little information on the number of broods raised each year in different parts of the range of the Eastern Mourning Dove. Is there a delay, or resting period, in nesting activities in mid-summer? We have some reports of adult moulting in late May and during June, which might indicate a temporary cessation of nesting. Do doves continue to nest while moulting? Will young doves raised early in the spring nest in the fall of that year? Is there a continued shifting of winter dove populations? Do the same birds return to the same wintering areas each year? When does pairing begin? Are doves paired before they leave winter quarters?

A study of the plumage changes during growth of the juvenile doves will enable us to determine the age of birds caught in traps and killed by hunters. A similar study of physiological changes during growth, nesting season, migration, and wintering periods would also be helpful.

We need dates of departure and arrival during migrations, for both northern and southern states. Banding and a study of shifting populations will provide such information. Probably there is a gradual southward movement of juveniles during the summer and fall months. These movements are of importance in regulating the shooting of doves, for some locally raised doves and some migrants should be harvested in each state. If too many local birds or too many migrants are taken the populations are adversely affected in different parts of the breeding range.

The information secured from returns will furnish helpful data on many of the above points.

## SUMMARY

A total of 33,247 doves have been banded from 1920 to 1948 in 33 states and provinces. Only 3.74% (1242) of these have been recovered, of which 561 were taken outside the state of original banding. The 11 southeastern states banded 45.6% of the doves. Approximately 64% of all returns were from these states but 78% of the 561 recoveries outside of the state of original banding were reported in these states. Such figures show the need for an intensive banding program in all states in the range of the Eastern Mourning Dove.



An analysis of the returns is given for each state. Little information on the speed of migration is given by the recoveries. Most of the returns to date in the southeastern states have been during the hunting season - September to January.

Two major migration routes are shown by the recovered birds. One is through the Mississippi Valley southward to the Gulf coast where it splits; one part continues through Louisiana and Texas to Mexico; the other part swings eastward along the Gulf Coast to Georgia and Florida. The other major route is down the Atlantic coast between the mountains and the ocean. This curves at the Gulf coast and goes westward along that coast.

An intensive dove banding program has been started recently in the southeastern states which will include continual trapping for a period of three years. A large amount of important information should be secured on the movements of doves. This paper indicates that more data are needed to properly regulate the hunting of doves and thus to perpetuate their populations.

(Note: This report will probably be published in somewhat condensed form in an early number of The Journal of Wildlife Management).



Table 1.

EASTERN MOURNING DOVES BANDED 1920 TO JUNE 30, 1948

State	Adult	Juvenile	Total
Alabama	2006	549	2555
Arkansas	96	0	96
Connecticut	1	3	9
Delaware	14	0	14
District of Columbia	60	29	89
Florida	7095	1	7096
Georgia	217	237	454
Illinois	2001	198	2199
Indiana	512	900	1412
Iowa	63	1629	1697
Kentucky	18	159	177
Louisiana	224	11	235
Maine	5	0	5
Maryland	408	4	412
Massachusetts	2701	459	3160
Michigan	1624	339	1963
Minnesota	380	43	423
Mississippi	2	1329	1331
Missouri	96	348	444
New Hampshire	70	0	70
New Jersey	416	19	435
New York	850	84	934
North Carolina	2040	468	2508
Ohio	2110	962	3072
Ontario	32	13	45
Pennsylvania	950	83	1033
Quebec	2	0	2
South Carolina	144	2	146
Tennessee	384	39	423
Texas	60	61	121
Virginia	79	43	122
West Virginia	8	0	8
Wisconsin	421	136	557
TOTAL	25,094	8,153	33,247





Table 2.

## RECOVERIES OF EASTERN SCOVING DOVE

[illegible]



### RECOVERIES OF DOVES BANDED IN HUNTING STATES:

\*56.3% of all doves banded.

Recoveries in the State of banding are not included in this table.

1875-1876

1876-1877

1877-1878

1878-1879

1879-1880

1880-1881

1881-1882

1882-1883

1883-1884

1884-1885

1885-1886

1886-1887

1887-1888

1888-1889

1889-1890

1890-1891

1891-1892

1892-1893

1893-1894



Table 4.

RECOVERIES OF DOVES BANDED IN NON-HUNTING STATES:

Banded In:	Recovered in Hunting States:													Recovered in Non-Hunting States:			No. Banded	% Recovered								
	Ala.	Ariz.	Ark.	Dela.	Fla.	Ga.	Ill.	Ky.	La.	Md.	Mex.	Miss.	N.C.	Okla.	S.C.	Tenn.			Tex.	Va.	Ind.	Mich.	Nebr.	N.J.	No. States	Total Recovered
D.C.													1										2	4	89	4.49 <sup>0</sup> / <sub>0</sub>
Ind.	5	1			10	7	1		4	3		2	2	1			6			1			12	41	1412	2.90
Iowa									1		7			3			18				1		5	30	1697	1.77
Man.					1																		1	1	1	4.90 <sup>0</sup> / <sub>0</sub>
Mass.	7				11	35			2	3		12	19	1			1	2				1	12	95	3160	3.01
Mich.	12				20	24	1	1	9	1	4	6	3	2			7		2				13	92	1963	4.67
Minn.																	6						1	6	423	1.42
N.J.					1	3						2											3	6	435	1.38
N.Y.	1				5	9			1	2		4	4										7	26	934	2.78
Ohio	11	2			11	13			8		3	3	4	1			3		1	1			12	61	3072	1.66
Ont.						2																	2	2	45	4.44
W.Va.	1					1			1														2	2	8	25.00
Wisc.	2				1	3								1			4						6	12	557	2.15

No. States 7 1 1 1 8 9 2 1 7 4 3 2 7 1 6 3 7 1 2 2 1 1

Total Doves 39 2 1 1 60 97 2 1 26 9 11 6 30 3 32 4 45 2 3 2 1 1 378 13,796\* 2.75%

\*41.5% of all doves banded.

Recoveries in the State of banding are not included in this table.



Table 5.

ANALYSIS OF DIRECTION AS SHOWN BY RECOVERIES OF BANDED BIRDS:Southward Migration:

## 1. From West Side of Mississippi River:

From Minnesota, Iowa, &amp; Missouri to:

Nebraska	1
Kansas	1
Oklahoma	4
Texas	27
Louisiana	2
Mexico	8
Guatemala	1
	<u>44</u>

Georgia (1 from Missouri)

Total - 45

All go south to west of Mississippi River, except 1 from Missouri to Georgia. (Reverse 1 from Alabama to Missouri).

. . . . .

## 2. From Michigan, Indiana, &amp; Ohio to:

Kentucky	1	Mississippi	2
Tennessee	3	Alabama	28
Arkansas	1	Georgia	44
Louisiana	21	Florida	<u>41</u>
Texas	10		115
Mexico	4		
	<u>40</u>	Maryland	1
		No. Carolina	11
		So. Carolina	8
Arizona	2		<u>20</u>

Total - 177

Divide: Part go southwest across Kentucky & Tennessee, to cross Miss. Valley; others move south to Mississippi and east along Gulf Coast south of mountains. Others move east and then south on east side of mountains (or move north on east side of mountains).

## 2. From Mississippi River Valley (east-side):

From Wisconsin &amp; Illinois to:

Arkansas	3	Tennessee	2
Louisiana	12	Alabama	5
Texas	18	Georgia	18
	<u>33</u>	So. Carolina	1
		Florida	<u>11</u>
			37

Total - 70

Divides: Part go slightly southwest across River to Arkansas & Louisiana; others go southeast to Gulf Coast & around south of mountains, to Alabama Georgia, South Carolina, & Florida. (Reverse: Florida to Illinois - 8).

. . . . .

## 4. From Massachusetts, New York, Pennsylvania, &amp; New Jersey to:

Delaware	1	Alabama	10
Maryland	5	Louisiana	3
Virginia	4	Texas	<u>1</u>
Tennessee	1		14
No. Carolina	23		
So. Carolina	28	Prince Edw. Island:	
Georgia	54		1
Florida	20		<u>1</u>
	<u>136</u>		

Total - 151

Follows south on coastal plain to Gulf Coast, then westward. (Except 1 to Tennessee). (Reverse: North to Prince Edward Island).

. . . . .

## 5. From Maryland, West Virginia, &amp; Virginia to:

North Carolina	1
South Carolina	2
Georgia	3
Florida	2
Alabama	<u>1</u>
	9

Follow south on coastal plain to Gulf of Mexico & west to Alabama.



Table 6.

SUMMARY OF RECOVERIES IN THE SAME STATE AS ORIGINALLY Banded:

State:	Recovered:								Total:
	Same Year	1 Yr. Later	2 Yr. Later	3 Yr. Later	4 Yr. Later	5 Yr. Later	6 Yr. Later	7 Yr. Later	
Alabama	42	21	13	2	1		1	1	81
Arkansas		1							1
Florida	142	23	7	3	3	1			179
Georgia	22	6	2						30
Illinois	31	16	7	2					56
Indiana	9	8	2	1					20
Iowa	2	2	1	1					6
Kentucky	2	1							3
Louisiana	7	1							8
Maryland	17	7	4						28
Massachusetts	11	9	4	3	1	1		1	30
Michigan	5	6	2	1					14
Minnesota	3	1			1				5
Mississippi	5	3							8
New Jersey	6	3	2	1		1	1		14
New York	13	18	13	3					47
North Carolina	25	3	2	1		1			32
Ohio	33	18	6	1	1	1			60
Ontario	1								1
Pennsylvania	11	12	2	1	1				27
South Carolina	2	1							3
Tennessee	10	3	1						14
Texas	4	1	1						6
Wisconsin	4	4							8
TOTALS:	407	168	69	20	8	5	1	1	681

Percentage of

Total: 59.8 24.7 10.1



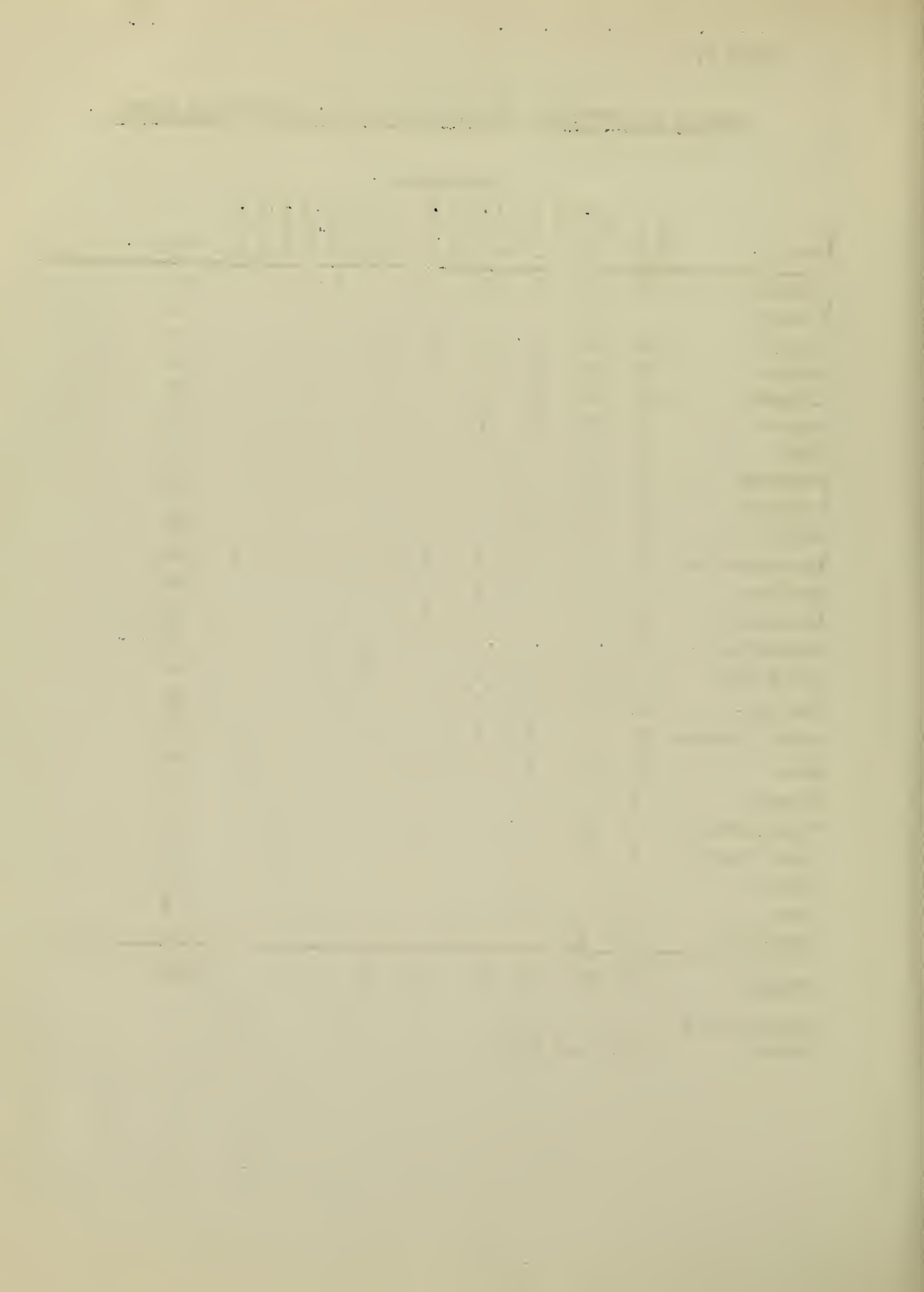


Table 7.

SUMMARY OF RECOVERIES FROM OTHER STATES:

Banded In:	Recovered:								Total:	
	Same Year	1 Yr. Later	2 Yr. Later	3 Yr. Later	4 Yr. Later	5 Yr. Later	6 Yr. Later	7 Yr. Later		8 Yr. Later
Alabama	15	4	2							21
D. C.	3		1							4
Florida	22	14	6	2			1		1	46
Georgia	1									1
Illinois	37	14	2	2	3					58
Indiana	19	10	1	3	6	1	1			41
Iowa	9	12	6	1	1				1	30
Manitoba		1								1
Maryland	1	2								3
Massachusetts	67	13	6	6	2	1				95
Michigan	56	20	5	5	5	1				92
Minnesota	2	2	1				1			6
Mississippi		1								1
Missouri	4	1	3	1						9
New Jersey	3	2		1						6
New York	19	4	3							26
North Carolina	7	1								8
Ohio	44	11	3		1		1	1		61
Ontario	2									2
Pennsylvania	16	5	2	1	1					25
South Carolina		2								2
Tennessee	1	3								4
Virginia	3	1	1							5
West Virginia	1		1							2
Wisconsin	9	1	2							12
TOTALS:	341	124	45	22	19	3	4	1	2	561

Percentage of

Total: 60.8 22.1 8.2

# REPORT

NAME		ADDRESS		CITY		STATE		COUNTRY	
1	Mr. J. H. Smith	123 Main St.	Chicago	Ill.	U.S.A.				
2	Mr. A. B. Jones	456 Oak St.	Chicago	Ill.	U.S.A.				
3	Mr. C. D. Brown	789 Elm St.	Chicago	Ill.	U.S.A.				
4	Mr. E. F. Green	101 Maple St.	Chicago	Ill.	U.S.A.				
5	Mr. G. H. White	202 Pine St.	Chicago	Ill.	U.S.A.				
6	Mr. I. J. Black	303 Cedar St.	Chicago	Ill.	U.S.A.				
7	Mr. K. L. Gray	404 Birch St.	Chicago	Ill.	U.S.A.				
8	Mr. M. N. Blue	505 Spruce St.	Chicago	Ill.	U.S.A.				
9	Mr. O. P. Red	606 Fir St.	Chicago	Ill.	U.S.A.				
10	Mr. Q. R. Yellow	707 Willow St.	Chicago	Ill.	U.S.A.				
11	Mr. S. T. Purple	808 Ash St.	Chicago	Ill.	U.S.A.				
12	Mr. U. V. Pink	909 Hickory St.	Chicago	Ill.	U.S.A.				
13	Mr. W. X. Brown	1010 Chestnut St.	Chicago	Ill.	U.S.A.				
14	Mr. Y. Z. Green	1111 Madison St.	Chicago	Ill.	U.S.A.				
15	Mr. A. B. White	1212 Monroe St.	Chicago	Ill.	U.S.A.				
16	Mr. C. D. Black	1313 Lincoln St.	Chicago	Ill.	U.S.A.				
17	Mr. E. F. Gray	1414 Taylor St.	Chicago	Ill.	U.S.A.				
18	Mr. G. H. Blue	1515 Jackson St.	Chicago	Ill.	U.S.A.				
19	Mr. I. J. Red	1616 Adams St.	Chicago	Ill.	U.S.A.				
20	Mr. K. L. Yellow	1717 Franklin St.	Chicago	Ill.	U.S.A.				
21	Mr. M. N. Purple	1818 Clark St.	Chicago	Ill.	U.S.A.				
22	Mr. O. P. Pink	1919 Washington St.	Chicago	Ill.	U.S.A.				
23	Mr. Q. R. Brown	2020 Madison St.	Chicago	Ill.	U.S.A.				
24	Mr. S. T. Green	2121 Monroe St.	Chicago	Ill.	U.S.A.				
25	Mr. U. V. White	2222 Lincoln St.	Chicago	Ill.	U.S.A.				
26	Mr. W. X. Black	2323 Taylor St.	Chicago	Ill.	U.S.A.				
27	Mr. Y. Z. Gray	2424 Jackson St.	Chicago	Ill.	U.S.A.				
28	Mr. A. B. Blue	2525 Adams St.	Chicago	Ill.	U.S.A.				
29	Mr. C. D. Red	2626 Franklin St.	Chicago	Ill.	U.S.A.				
30	Mr. E. F. Yellow	2727 Clark St.	Chicago	Ill.	U.S.A.				
31	Mr. G. H. Purple	2828 Washington St.	Chicago	Ill.	U.S.A.				
32	Mr. I. J. Pink	2929 Madison St.	Chicago	Ill.	U.S.A.				
33	Mr. K. L. Brown	3030 Monroe St.	Chicago	Ill.	U.S.A.				
34	Mr. M. N. Green	3131 Lincoln St.	Chicago	Ill.	U.S.A.				
35	Mr. O. P. White	3232 Taylor St.	Chicago	Ill.	U.S.A.				
36	Mr. Q. R. Black	3333 Jackson St.	Chicago	Ill.	U.S.A.				
37	Mr. S. T. Gray	3434 Adams St.	Chicago	Ill.	U.S.A.				
38	Mr. U. V. Blue	3535 Franklin St.	Chicago	Ill.	U.S.A.				
39	Mr. W. X. Red	3636 Clark St.	Chicago	Ill.	U.S.A.				
40	Mr. Y. Z. Yellow	3737 Washington St.	Chicago	Ill.	U.S.A.				
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42	Mr. C. D. Pink	3939 Monroe St.	Chicago	Ill.	U.S.A.				
43	Mr. E. F. Brown	4040 Lincoln St.	Chicago	Ill.	U.S.A.				
44	Mr. G. H. Green	4141 Taylor St.	Chicago	Ill.	U.S.A.				
45	Mr. I. J. White	4242 Jackson St.	Chicago	Ill.	U.S.A.				
46	Mr. K. L. Black	4343 Adams St.	Chicago	Ill.	U.S.A.				
47	Mr. M. N. Gray	4444 Franklin St.	Chicago	Ill.	U.S.A.				
48	Mr. O. P. Blue	4545 Clark St.	Chicago	Ill.	U.S.A.				
49	Mr. Q. R. Red	4646 Washington St.	Chicago	Ill.	U.S.A.				
50	Mr. S. T. Yellow	4747 Madison St.	Chicago	Ill.	U.S.A.				
51	Mr. U. V. Purple	4848 Monroe St.	Chicago	Ill.	U.S.A.				
52	Mr. W. X. Pink	4949 Lincoln St.	Chicago	Ill.	U.S.A.				
53	Mr. Y. Z. Brown	5050 Taylor St.	Chicago	Ill.	U.S.A.				
54	Mr. A. B. Green	5151 Jackson St.	Chicago	Ill.	U.S.A.				
55	Mr. C. D. White	5252 Adams St.	Chicago	Ill.	U.S.A.				
56	Mr. E. F. Black	5353 Franklin St.	Chicago	Ill.	U.S.A.				
57	Mr. G. H. Gray	5454 Clark St.	Chicago	Ill.	U.S.A.				
58	Mr. I. J. Blue	5555 Washington St.	Chicago	Ill.	U.S.A.				
59	Mr. K. L. Red	5656 Madison St.	Chicago	Ill.	U.S.A.				
60	Mr. M. N. Yellow	5757 Monroe St.	Chicago	Ill.	U.S.A.				
61	Mr. O. P. Purple	5858 Lincoln St.	Chicago	Ill.	U.S.A.				
62	Mr. Q. R. Pink	5959 Taylor St.	Chicago	Ill.	U.S.A.				
63	Mr. S. T. Brown	6060 Jackson St.	Chicago	Ill.	U.S.A.				
64	Mr. U. V. Green	6161 Adams St.	Chicago	Ill.	U.S.A.				
65	Mr. W. X. White	6262 Franklin St.	Chicago	Ill.	U.S.A.				
66	Mr. Y. Z. Black	6363 Clark St.	Chicago	Ill.	U.S.A.				
67	Mr. A. B. Gray	6464 Washington St.	Chicago	Ill.	U.S.A.				
68	Mr. C. D. Blue	6565 Madison St.	Chicago	Ill.	U.S.A.				
69	Mr. E. F. Red	6666 Monroe St.	Chicago	Ill.	U.S.A.				
70	Mr. G. H. Yellow	6767 Lincoln St.	Chicago	Ill.	U.S.A.				
71	Mr. I. J. Purple	6868 Taylor St.	Chicago	Ill.	U.S.A.				
72	Mr. K. L. Pink	6969 Jackson St.	Chicago	Ill.	U.S.A.				
73	Mr. M. N. Brown	7070 Adams St.	Chicago	Ill.	U.S.A.				
74	Mr. O. P. Green	7171 Franklin St.	Chicago	Ill.	U.S.A.				
75	Mr. Q. R. White	7272 Clark St.	Chicago	Ill.	U.S.A.				
76	Mr. S. T. Black	7373 Washington St.	Chicago	Ill.	U.S.A.				
77	Mr. U. V. Gray	7474 Madison St.	Chicago	Ill.	U.S.A.				
78	Mr. W. X. Blue	7575 Monroe St.	Chicago	Ill.	U.S.A.				
79	Mr. Y. Z. Red	7676 Lincoln St.	Chicago	Ill.	U.S.A.				
80	Mr. A. B. Yellow	7777 Taylor St.	Chicago	Ill.	U.S.A.				
81	Mr. C. D. Purple	7878 Jackson St.	Chicago	Ill.	U.S.A.				
82	Mr. E. F. Pink	7979 Adams St.	Chicago	Ill.	U.S.A.				
83	Mr. G. H. Brown	8080 Franklin St.	Chicago	Ill.	U.S.A.				
84	Mr. I. J. Green	8181 Clark St.	Chicago	Ill.	U.S.A.				
85	Mr. K. L. White	8282 Washington St.	Chicago	Ill.	U.S.A.				
86	Mr. M. N. Black	8383 Madison St.	Chicago	Ill.	U.S.A.				
87	Mr. O. P. Gray	8484 Monroe St.	Chicago	Ill.	U.S.A.				
88	Mr. Q. R. Blue	8585 Lincoln St.	Chicago	Ill.	U.S.A.				
89	Mr. S. T. Red	8686 Taylor St.	Chicago	Ill.	U.S.A.				
90	Mr. U. V. Yellow	8787 Jackson St.	Chicago	Ill.	U.S.A.				
91	Mr. W. X. Purple	8888 Adams St.	Chicago	Ill.	U.S.A.				
92	Mr. Y. Z. Pink	8989 Franklin St.	Chicago	Ill.	U.S.A.				
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95	Mr. E. F. White	9292 Madison St.	Chicago	Ill.	U.S.A.				
96	Mr. G. H. Black	9393 Monroe St.	Chicago	Ill.	U.S.A.				
97	Mr. I. J. Gray	9494 Lincoln St.	Chicago	Ill.	U.S.A.				
98	Mr. K. L. Blue	9595 Taylor St.	Chicago	Ill.	U.S.A.				
99	Mr. M. N. Red	9696 Jackson St.	Chicago	Ill.	U.S.A.				
100	Mr. O. P. Yellow	9797 Adams St.	Chicago	Ill.	U.S.A.				